Jieke Shi

Research Scientist | NRF Postdoctoral Award Recipient
Singapore Management University

Address: College of Integrative Studies, B2,
RISE Center, 10 Canning Rise, Singapore 179873

E-Mail: jiekeshi@smu.edu.sg

Website: https://jiekeshi.tech

RESEARCH INTERESTS

Software Engineering, Program Synthesis, LLM4Code, Performance Engineering, Software Analytics, Mining Software Repositories, Empirical Study, Software Testing

I develop **synthesis-assisted techniques** to **optimize the performance** of AI software, particularly LLMs trained on code from open-source repositories, and to **validate the safety** of software systems, from finding bugs in **core software infrastructure** to detecting safety violations in **AI systems that use neural controllers**.

I have published **43 papers** in top-tier venues such as ICSE, ASE, FSE, MSR, TOSEM, and TSE, **16 of which list me as first, co-first, or corresponding author**. My work has received **7 paper awards and honors** and **2 reviewer/PC awards**. My research has also had **real-world open-source impact**, including reporting **504 bugs, vulnerabilities, and license violations** in projects such as GCC, Clang, rustc, OpenSSL, curl, FFmpeg, and OP-TEE, of which **246 have been confirmed or fixed**.

EMPLOYMENT

Apr 2026 – Present **Singapore Management University**, Research Scientist (Singapore NRF Postdoctoral Award)
Sole PI of the S$250k NRF-funded project *"Optimizing and Fortifying AI-Assisted Software Ad Absurdum"*.

Jun 2021 – Mar 2026 **Singapore Management University**, Research Engineer
Lead research staff under the AI.SG Programme on testing reinforcement learning systems.

EDUCATION

Aug 2022 – Mar 2026 **Singapore Management University**, Ph.D. in Computer Science
Supervisor: David Lo, ACM/IEEE/ASE Fellow, OUB Chair Professor & Vice Provost (Research)
Dissertation: *Optimizing and Fortifying AI Software through the Lens of Artifact Synthesis*

Aug 2016 – Jun 2020 **Yangzhou University**, B.Eng. in Electronic Information Engineering

PUBLICATIONS

Full publication list: jiekeshi.tech/publications. On papers marked (✉ Corr.), I served as a corresponding author and took a primary role in supervising the research.

2027

[43] Chengyan Ma, **Jieke Shi (✉ Corr.)**, Ruidong Han, Weifeng Sun, Yuqing Niu, Yunbo Lyu, Zhou Yang, and David Lo. *"Missing Security-Fix Backporting for GitHub Actions Workflows"*. In Proceedings of the 49th IEEE/ACM International Conference on Software Engineering (**ICSE 2027**, Research Track).
CRediT roles: Conceptualization, Methodology, Software, Validation, Writing – review & editing, Supervision.
Dissertation relation: Separate study of security fixes in GitHub Actions workflows.

[42] Junda He, Xiangyu Shan, **Jieke Shi**, Yunbo Lyu, Gou Tan, Xiuwei Shang, Zhou Yang, Christoph Treude, and David Lo. *"When Agreement Hides Disagreement: Are We Evaluating LLM Judges Fairly?"*. In Proceedings of the 49th IEEE/ACM International Conference on Software Engineering (**ICSE 2027**, Research Track).

CRediT roles: Investigation, Methodology, Formal Analysis, Validation, Writing – review & editing.
Dissertation relation: Separate study of disagreement among LLM judges.

2026

[41] Huihui Huang, **Jieke Shi (Corr.)**, Bo Wang, Zhou Yang, and David Lo. *"Finding Memory Leaks in C/C++ Programs via Neuro-Symbolic Augmented Static Analysis"*. In Proceedings of the Annual Computer Security Applications Conference (**ACSAC 2026**, Technical Paper), 16 pages. [PDF] [Code]

CRediT roles: Conceptualization, Methodology, Software, Validation, Writing – review & editing, Supervision.
Dissertation relation: Separate study of memory-leak detection in C/C++ programs.

[40] Chengyan Ma, Ruidong Han, **Jieke Shi (Corr.)**, Ye Liu, Yuqing Niu, Di Lu, Chuang Tian, Jianfeng Ma, Debin Gao, and David Lo. *"DITING: A Static Analyzer for Identifying Bad Partitioning Issues in TEE Applications"*. IEEE Transactions on Software Engineering (**TSE 2026**). [PDF] [Code]

CRediT roles: Conceptualization, Methodology, Software, Validation, Writing – review & editing, Supervision.
Dissertation relation: Separate study of partitioning issues in trusted execution environments.

[39] Gou Tan, Zhensu Sun, **Jieke Shi**, Ting Zhang, Zilong He, Qingfu Wu, Shuai Liang, Weifeng Sun, Junda He, Pengfei Chen, Chuanfu Zhang, Lwin Khin Shar, and David Lo. *"AgentChaos: Chaos Engineering for Agent Systems via Programmatic Fault Injection"*. In Proceedings of the 41st IEEE/ACM International Conference on Automated Software Engineering (**ASE 2026**, Research Track).

CRediT roles: Investigation, Methodology, Formal Analysis, Validation, Writing – review & editing.
Dissertation relation: Separate study of fault injection in agentic systems.

[38] Weifeng Sun, **Jieke Shi**, Zhou Yang, Yuchen Chen, Hongyan Li, Meng Yan, and David Lo. *"How Reasoning Shapes Social Bias in LLM-Generated Code?"*. In Proceedings of the 41st IEEE/ACM International Conference on Automated Software Engineering (**ASE 2026**, Research Track).

CRediT roles: Conceptualization, Methodology, Validation, Writing – review & editing, Visualization, Resources, Funding acquisition.
Dissertation relation: Separate study of social bias in code generated by LLMs.

[37] Xiuwei Shang, Li Hu, Xiao Jiang, **Jieke Shi (Corr.)**, Junda He, Zhou Yang, Shaoyin Cheng, Guoqiang Chen, Weiming Zhang, and David Lo. *"Beyond Text Matching: Towards Reference-Free Evaluation for Human-Oriented Binary Reverse Engineering"*. In Proceedings of the 41st IEEE/ACM International Conference on Automated Software Engineering (**ASE 2026**, Research Track).

CRediT roles: Conceptualization, Methodology, Validation, Writing – review & editing, Supervision.
Dissertation relation: Separate study of evaluation methods for binary reverse engineering.

[36] Thong Hoang, Mykhailo Klymenko, Xiwei Xu, Shidong Pan, Yi Ding, Xushuo Tang, Zhengyi Yang, **Jieke Shi**, and David Lo. *"ESG Reporting Lifecycle Management with Large Language Models and AI Agents"*. In Proceedings of the 23rd IEEE International Conference on Software Architecture (**ICSA 2026**, Software Architecture in Practice Track). [PDF]

CRediT roles: Writing – review & editing.
Dissertation relation: Separate study of agent-supported sustainability reporting.

[35] **Jieke Shi**, Junda He, Zhou Yang, Chengran Yang, Mykhailo Klymenko, Thong Hoang, Sherry Xu, Zhenchang Xing, and David Lo. *"Compiling Code LLMs into Lightweight Executables"*. In Proceedings of the 34th ACM International Conference on the Foundations of Software Engineering (**FSE 2026**, Research Track, **Featured by SMU Research News**), 24 pages. [PDF] [Code]

CRediT roles: Conceptualization, Methodology, Software, Investigation, Formal analysis, Validation, Visualization, Writing – original draft, Writing – review & editing.
Dissertation relation: Chapter 5.

[34] Chengyan Ma, **Jieke Shi (Corr.)**, Ruidong Han, Ye Liu, Feng Li, Yuqing Niu, and David Lo. *"Automated Repair of TEE Partitioning Issues via DSL-Guided and LLM-Assisted Patching"*. In Proceedings of the 34th ACM International Conference on the Foundations of Software Engineering (**FSE 2026**, Research Track), 24 pages.

CRediT roles: Conceptualization, Methodology, Software, Investigation, Formal analysis, Validation, Writing – review & editing, Supervision.
Dissertation relation: Separate study of automated repair in trusted execution environments.

[33] Yuqing Niu, **Jieke Shi (Corr.)**, Ruidong Han, Ye Liu, Chengyan Ma, Yunbo Lyu, and David Lo. *"What You Trust Is Insecure: Demystifying How Developers (Mis)Use Trusted Execution Environments in Practice"*. In Proceedings of the 33rd IEEE International Conference on Software Analysis, Evolution and Reengineering (**SANER 2026**, Research Track, **IEEE Computer Society TCSE Distinguished Paper Award**). [PDF] [Code]

CRediT roles: Conceptualization, Methodology, Data Curation, Investigation, Formal analysis, Validation, Writing – review & editing, Supervision.
Dissertation relation: Separate empirical study of how developers use TEEs.

[32] Bo Wang, Yueyang Chen, **Jieke Shi**, Minghui Li, Yunbo Lyu, Yinan Wu, Youfang Lin, and Zhou Yang. *"Hidden Licensing Risks in the LLMware Ecosystem"*. In Proceedings of the 35th ACM SIGSOFT International Symposium on Software Testing and Analysis (**ISSTA 2026**, Research Track). [PDF] [Code]

CRediT roles: Investigation, Methodology, Formal Analysis, Validation, Writing – review & editing.
Dissertation relation: Separate repository mining study of licensing risks in AI software.

[31] Junda He, **Jieke Shi**, Zhou Yang, Mingfei Cheng, and David Lo. *"Learning from the Test: Self-Referential Differential Testing for Deep RL Agents"*. In Proceedings of the 35th ACM SIGSOFT International Symposium on Software Testing and Analysis (**ISSTA 2026**, Research Track). [PDF] [Code]

CRediT roles: Investigation, Methodology, Formal Analysis, Validation, Writing – review & editing.
Dissertation relation: Related work on testing reinforcement-learning agents, outside the controller chapters.

[30] Chengyan Ma, **Jieke Shi**, Ruidong Han, Ye Liu, Yuqing Niu, and David Lo. *"Finding Missing Input Validation in TEEs via LLM-Assisted Symbolic Execution"*. In Proceedings of the 3rd ACM International Conference on AI Foundation Models and Software Engineering (**FORGE 2026**, Research Papers Track, New Idea Paper). [PDF] [Code]

CRediT roles: Conceptualization, Methodology, Software, Investigation, Formal analysis, Validation, Writing – review & editing, Supervision.
Dissertation relation: Separate study of input validation in trusted execution environments.

[29] Chengran Yang, Zhensu Sun, Hong Jin Kang, **Jieke Shi**, and David Lo. *"Think Like Human Developers: Harnessing Community Knowledge for Structured Code Reasoning"*. In Proceedings of the 48th IEEE/ACM International Conference on Software Engineering (**ICSE 2026**, Research Track, **ACM SIGSOFT Distinguished Paper Award**). [PDF]

CRediT roles: Investigation, Formal analysis, Validation, Writing – review & editing.
Dissertation relation: Separate study of training data for LLM reasoning.

[28] Huihui Huang, Ratnadira Widyasari, Ting Zhang, Ivana Clairine IRSAN, **Jieke Shi (✉ Corr.)**, Han Wei Ang, Frank Liauw, Eng Lieh Ouh, Lwin Khin Shar, Hong Jin Kang, and David Lo. *"Back to the Basics: Rethinking Issue-Commit Linking with LLM-Assisted Retrieval"*. In Proceedings of the 48th IEEE/ACM International Conference on Software Engineering (**ICSE 2026**, Research Track). [PDF] [Code]

CRediT roles: Conceptualization, Methodology, Software, Investigation, Formal analysis, Validation, Writing – review & editing, Supervision.
Dissertation relation: Separate repository mining study on linking issue reports to commits.

[27] Junda He, **Jieke Shi**, Terry Yue Zhuo, Christoph Treude, Jiamou Sun, Zhenchang Xing, Xiaoning Du, and David Lo. *"LLM-as-a-Judge for Software Engineering: Literature Review, Vision, and the Road Ahead"*. ACM Transactions on Software Engineering and Methodology (**TOSEM 2026**). [PDF]

CRediT roles: Data curation, Investigation, Formal analysis, Validation, Writing – review & editing.
Dissertation relation: Related literature review on LLM-based evaluation in software engineering.

[26] Huihui Huang, **Jieke Shi**, Junkai Chen, Ting Zhang, Yikun Li, Chengran Yang, Eng Lieh Ouh, Lwin Khin Shar, and David Lo. *"PenForge: On-the-Fly Expert Agent Construction for Automated Penetration Testing"*. In Proceedings of the 48th IEEE/ACM International Conference on Software Engineering (**ICSE 2026**, NIER Track). [PDF] [Code]

CRediT roles: Conceptualization, Methodology, Software, Investigation, Formal analysis, Validation, Writing – review & editing, Supervision.
Dissertation relation: Separate study of agent-based security testing.

[25] Junkai Chen, Huihui Huang, Yunbo Lyu, Junwen An, **Jieke Shi**, Chengran Yang, Ting Zhang, Haoye Tian, Yikun Li, Zhenhao Li, Xin Zhou, Xing Hu, and David Lo. *"SecureVibeBench: Evaluating Secure Coding Capabilities of Code Agents with Realistic Vulnerability Scenarios"*. In Proceedings of the 64th Annual Meeting of the Association for Computational Linguistics (**ACL 2026**, Main Conference, Long Paper). [PDF][Code]

CRediT roles: Conceptualization, Methodology, Data curation, Investigation, Formal analysis, Validation, Writing – review & editing.
Dissertation relation: Separate benchmark for evaluating code agents on repository-level tasks.

[24] Chengran Yang, Ting Zhang, Jinfeng Jiang, Xin Zhou, Haoye Tian, Mingzhe Du, **Jieke Shi**, Junkai Chen, Yikun Li, Eng Lieh Ouh, Lwin Khin Shar, and David Lo. *"SeCuRepair: Semantics-Aligned, Curriculum-Driven, and Reasoning-Enhanced Vulnerability Repair Framework"*. In Proceedings of the 64th Annual Meeting of the Association for Computational Linguistics (**ACL 2026**, Main Conference, Long Paper, Oral, 🏆**SAC Highlight Award**). [PDF]

CRediT roles: Investigation, Formal analysis, Validation, Writing – review & editing.
Dissertation relation: Separate study of automated vulnerability repair.

2025

[23] **Jieke Shi**, Junda He, Zhou Yang, Đorđe Žikelić, and David Lo. *"Synthesizing Efficient and Permissive Programmatic Runtime Shields for Neural Policies"*. ACM Transactions on Software Engineering and Methodology (**TOSEM 2025**). [PDF] [Code]

CRediT roles: Conceptualization, Methodology, Software, Investigation, Formal analysis, Validation, Visualization, Writing – original draft, Writing – review & editing.
Dissertation relation: Chapter 7.

[22] **Jieke Shi**, Zhou Yang, Junda He, Bowen Xu, Dongsun Kim, DongGyun Han, and David Lo. *"Finding Safety Violations of AI-Enabled Control Systems through the Lens of Synthesized Proxy Programs"*. ACM Transactions on Software Engineering and Methodology (**TOSEM 2025**). [PDF] [Code]

CRediT roles: Conceptualization, Methodology, Software, Investigation, Formal analysis, Validation, Visualization, Writing – original draft, Writing – review & editing, Resources.
Dissertation relation: Chapter 6.

[21] **Jieke Shi**, Zhou Yang, and David Lo. *"Efficient and Green Large Language Models for Software Engineering: Literature Review, Vision, and the Road Ahead"*. ACM Transactions on Software Engineering and Methodology (**TOSEM 2025**, **117 citations in ∼1 year according to Google Scholar, as of Nov. 2026**). [PDF]

CRediT roles: Conceptualization, Methodology, Data curation, Investigation, Formal analysis, Validation, Visualization, Writing – original draft, Writing – review & editing.
Dissertation relation: Chapters 2 and 8.

[20] Zhou Yang, **Jieke Shi (✉ Corr.)**, Premkumar Devanbu, and David Lo. *"Ecosystem of Large Language Models for Code"*. ACM Transactions on Software Engineering and Methodology (**TOSEM 2025**). [PDF] [Code]

CRediT roles: Conceptualization, Methodology, Data curation, Investigation, Formal analysis, Validation, Writing – review & editing, Supervision.
Dissertation relation: Related empirical work on the code LLM ecosystem.

[19] Yunbo Lyu, Zhou Yang, **Jieke Shi**, Jianming Chang, Yue Liu, and David Lo. *""My productivity is boosted, but ..." Demystifying Users' Perception on AI Coding Assistants"*. In Proceedings of the 40th IEEE/ACM International Conference on Automated Software Engineering (**ASE 2025**, Research Track, 🏆**ACM SIGSOFT Distinguished Paper Award**). [PDF] [Code]

CRediT roles: Methodology, Data curation, Formal analysis, Validation, Writing – review & editing, Supervision.
Dissertation relation: Chapter 5 cites this study in motivating local deployment of code models.

[18] Zhou Yang, **Jieke Shi**, Muhammad Hilmi Asyrofi, Bowen Xu, Xin Zhou, DongGyun Han, and David Lo. *"Prioritizing Speech Test Cases"*. ACM Transactions on Software Engineering and Methodology (**TOSEM 2025**). [PDF] [Code]

CRediT roles: Software, Data curation, Investigation, Validation, Writing – review & editing.
Dissertation relation: Separate study of test prioritization for speech recognition.

2024

[17] Zhou Yang, Zhipeng Zhao, Chenyu Wang, **Jieke Shi**, Dongsun Kim, DongGyun Han, and David Lo. *"Gotcha! This Model Uses My Code! Evaluating Membership Leakage Risks in Code Models"*. IEEE Transactions on Software Engineering (**TSE 2024**). [PDF]

CRediT roles: Formal analysis, Validation, Visualization, Writing – review & editing.
Dissertation relation: Chapter 6 cites this study in its discussion of future work on code models.

[16] **Jieke Shi**, Zhou Yang, Hong Jin Kang, Bowen Xu, Junda He, and David Lo. *"Greening Large Language Models of Code"*. In Proceedings of the 46th IEEE/ACM International Conference on Software Engineering (**ICSE 2024**, Software Engineering in Society (SEIS) Track, **Most Cited Paper in ICSE 2024 SEIS Track, Google Scholar, Nov. 2026**). [PDF] [Code]

CRediT roles: Conceptualization, Methodology, Software, Investigation, Formal analysis, Validation, Visualization, Writing – original draft, Writing – review & editing.
Dissertation relation: Chapter 4.

[15] Zhou Yang, Bowen Xu, Jie M. Zhang, Hong Jin Kang, **Jieke Shi**, Junda He, and David Lo. *"Stealthy Backdoor Attack for Code Models"*. IEEE Transactions on Software Engineering (**TSE 2024,** 🏆 **IEEE Computer Society Best Paper Award**). [PDF] [Code]

CRediT roles: Investigation, Formal analysis, Validation, Writing – review & editing.
Dissertation relation: Separate study of security vulnerabilities in code models.

[14] Chen Gong, Zhou Yang, Yunpeng Bai, Junda He, **Jieke Shi**, Kecen Li, Arunesh Sinha, Bowen Xu, Xinwen Hou, David Lo, and Tianhao Wang. *"BAFFLE: Hiding Backdoors in Offline Reinforcement Learning Datasets"*. In Proceedings of the 45th IEEE Symposium on Security and Privacy (**S&P 2024**, Main Track). [PDF] [Code]

CRediT roles: Conceptualization, Methodology, Validation, Writing – review & editing, Supervision.
Dissertation relation: Related work on datasets for offline reinforcement learning.

[13] Junda He, Zhou Yang, **Jieke Shi**, Chengran Yang, Kisub Kim, Bowen Xu, Xin Zhou, and David Lo. *"Curiosity-Driven Testing for Sequential Decision-Making Process"*. In Proceedings of the 46th IEEE/ACM International Conference on Software Engineering (**ICSE 2024**, Research Track). [PDF] [Code]

CRediT roles: Methodology, Investigation, Formal analysis, Validation, Writing – review & editing.
Dissertation relation: Related study in discussing diversity in controller testing.

[12] Zhou Yang, Zhipeng Zhao, Chenyu Wang, **Jieke Shi**, Dongsun Kim, DongGyun Han, and David Lo. *"Unveiling Memorization in Code Models"*. In Proceedings of the 46th IEEE/ACM International Conference on Software Engineering (**ICSE 2024**, Research Track). [PDF] [Code]

CRediT roles: Data curation, Investigation, Formal analysis, Validation, Writing – review & editing.
Dissertation relation: Related study in discussing other issues of code LLMs.

2023

[11] Zhou Yang, Chenyu Wang, **Jieke Shi**, Thong Hoang, Pavneet Kochhar, Qinghua Lu, Zhenchang Xing, and David Lo. *"What Do Users Ask in Open-Source AI Repositories? An Empirical Study of GitHub Issues"*. In Proceedings of the 20th IEEE/ACM International Conference on Mining Software Repositories (**MSR 2023**, Technical Papers Track). [PDF] [Code]

CRediT roles: Conceptualization, Methodology, Software, Data curation, Investigation, Formal analysis, Validation, Writing – review & editing.
Dissertation relation: Related motivation study in discussing issues of AI software.

2022

[10] **Jieke Shi**, Zhou Yang, Bowen Xu, Hong Jin Kang, and David Lo. *"Compressing Pre-trained Models of Code into 3 MB"*. In Proceedings of the 37th IEEE/ACM International Conference on Automated Software Engineering (**ASE 2022**, Research Track, 🎖️**ACM SIGSOFT Distinguished Paper Award Nomination**, **Top 10 Most Cited Papers in ASE 2022 Research Track**). [PDF] [Poster] [Code]

CRediT roles: Conceptualization, Methodology, Software, Data curation, Investigation, Formal analysis, Validation, Visualization, Writing – original draft, Writing – review & editing.
Dissertation relation: Chapter 3.

[9] **Jieke Shi**, Zhou Yang, Junda He, Bowen Xu, and David Lo. *"Can Identifier Splitting Improve Open-Vocabulary Language Model of Code?"*. In Proceedings of the 29th IEEE International Conference on Software Analysis, Evolution and Reengineering (**SANER 2022**, ERA Track). [PDF] [Poster] [Code]

CRediT roles: Conceptualization, Methodology, Software, Investigation, Formal analysis, Validation, Visualization, Writing – original draft, Writing – review & editing.
Dissertation relation: Related study in discussion of tokenization.

[8] Chen Gong, Zhou Yang, Yunpeng Bai, **Jieke Shi**, Arunesh Sinha, Bowen Xu, David Lo, Xinwen Hou, Guoliang Fan. *"Curiosity-Driven and Victim-Aware Adversarial Policies"*. In Proceedings of the 38th Annual Computer Security Applications Conference (**ACSAC 2022**, Technical Paper, 🏆 **Honorable Mention Award**). [PDF] [Code]

CRediT roles: Conceptualization, Methodology, Software, Investigation, Validation, Visualization, Writing – original draft, Writing – review & editing, Supervision.
Dissertation relation: Related work on adversarial policies.

[7] Zhou Yang, **Jieke Shi**, Muhammad Hilmi Asyrofi, and David Lo. *"Revisiting Neuron Coverage Metrics and Quality of Deep Neural Networks"*. In Proceedings of the 29th IEEE International Conference on Software Analysis, Evolution and Reengineering (**SANER 2022**, RENE Track). [PDF] [Code]

CRediT roles: Software, Investigation, Formal analysis, Validation, Visualization, Writing – review & editing.
Dissertation relation: Related study as background for future AI testing efforts.

[6] Zhou Yang, **Jieke Shi**, Junda He, and David Lo. *"Natural Attack for Pre-trained Models of Code"*. In Proceedings of the 44th IEEE/ACM International Conference on Software Engineering (**ICSE 2022**, Technical Track). [PDF] [Code]

CRediT roles: Software, Investigation, Formal analysis, Validation, Writing – review & editing, Resources.
Dissertation relation: Chapters 3 and 4 draw on the evaluation procedures used in this study.

[5] Chengran Yang, Bowen Xu, Ferdian Thung, Yucen Shi, Ting Zhang, Zhou Yang, Xin Zhou, **Jieke Shi**, Junda He, DongGyun Han, and David Lo. *"Answer Summarization for Technical Queries: Benchmark and New Approach"*. In Proceedings of the 37th IEEE/ACM International Conference on Automated Software Engineering (**ASE 2022**, Research Track). [PDF] [Code]

CRediT roles: Investigation, Data curation, Validation, Writing – review & editing.
Dissertation relation: Separate study of answer summarization for developer questions.

[4] Ratnadira Widyasari, Stefanus Agus Haryono, Ferdian Thung, **Jieke Shi**, Constance Tan, Fiona Wee, Jack Phan, and David Lo. *"On the Influence of Biases in Bug Localization: Evaluation and Benchmark"*. In Proceedings of the 29th IEEE International Conference on Software Analysis, Evolution and Reengineering (**SANER 2022**, RENE Track). [PDF] [Code] [Dataset]

CRediT roles: Software, Investigation, Formal analysis, Validation, Writing – review & editing.
Dissertation relation: Chapter 6 cites this study as background for future research on bug localization.

2021

[3] Zhou Yang ⚖️, **Jieke Shi** ⚖️, Shaowei Wang, and David Lo. *"IncBL: Incremental Bug Localization"*. In Proceedings of the 36th IEEE/ACM International Conference on Automated Software Engineering (**ASE 2021**, Tool Demonstrations Track). [PDF] [Poster] [Code] *Co-first authors: Zhou Yang and Jieke Shi.*

CRediT roles: Conceptualization, Methodology, Software, Data curation, Investigation, Formal analysis, Validation, Visualization, Writing – original draft, Writing – review & editing.
Dissertation relation: Chapters 3 and 6 cite this work on interactive bug localization.

[2] Zhou Yang, Harshit Jain, **Jieke Shi**, Muhammad Hilmi Asyrofi, and David Lo. *"BiasHeal: On-the-Fly Black-Box Healing of Bias in Sentiment Analysis Systems"*. In Proceedings of the 37th IEEE International Conference on Software Maintenance and Evolution (**ICSME 2021**, NIER Track). [PDF] [Code]

CRediT roles: Investigation, Software, Validation, Writing – review & editing.
Dissertation relation: Separate study of bias in sentiment analysis software.

[1] Muhammad Hilmi Asyrofi, Zhou Yang, **Jieke Shi**, Chu Wei Quan, and David Lo. *"Can Differential Testing Improve Automatic Speech Recognition Systems?"*. In Proceedings of the 37th IEEE International Conference on Software Maintenance and Evolution (**ICSME 2021**, NIER Track). [PDF] [Code]

CRediT roles: Investigation, Software, Formal analysis, Validation, Writing – review & editing.
Dissertation relation: Chapter 6 cites this study as background for future work on testing.

PREPRINTS

[6] Wenjia Jiang, **Jieke Shi**, Zhensu Sun, Chengran Yang, Shidong Pan, Peixin Zhang, Yifan Jia, James Hoang, Xiwei Xu, Zhenchang Xing, David Lo, and Zhou Yang. *"Teaching Code Agents to Ask Without Leaking Private Code"*. arXiv preprint arXiv:2610.24824, 2026, 33 pages. [PDF] [Code]

CRediT roles: Conceptualization, Methodology, Investigation, Validation, Writing – review & editing.
Dissertation relation: Separate study of privacy in coding agents and cloud models.

[5] **Jieke Shi**, Junda He, Wenjia Jiang, Weifeng Sun, Shidong Pan, Zhensu Sun, Chengran Yang, Peixin Zhang, Yifan Jia, Zhou Yang, Thong Hoang, Xiwei Xu, Zhenchang Xing, and David Lo. *"Lossless Tensor Compression as Program Synthesis"*. arXiv preprint arXiv:2608.02162, 2026, 9 pages. [PDF] [Code]

CRediT roles: Conceptualization, Methodology, Software, Investigation, Formal analysis, Validation, Visualization, Writing – original draft, Writing – review & editing.
Dissertation relation: Extends the interest in compression to tensor data after the dissertation.

[4] Weifeng Sun, Ye Fan, Yuchen Chen, Gou Tan, **Jieke Shi (✉ Corr.)**, Yuan Yidi, Swee Liang Wong, Jonathan Pan, and David Lo. *"SciCodePile: A 128GB Corpus and Executable Benchmark for Challenging Scientific Code Generation"*. arXiv preprint arXiv:2607.19104, 2026, 27 pages. [PDF] [Code]

CRediT roles: Conceptualization, Methodology, Validation, Writing – review & editing, Supervision.
Dissertation relation: Separate work of benchmarking scientific code generation.

[3] Yunbo Lyu, **Jieke Shi**, Hong Jin Kang, Ratnadira Widyasari, Junda He, Yuqing Niu, Chengran Yang, Junkai Chen, Zhou Yang, Julia Lawall, and David Lo. *"AgentSZZ: Teaching the LLM Agent to Play Detective with Bug-Inducing Commits"*. arXiv preprint arXiv:2604.02665, 2026, 12 pages. [PDF] [Code]

CRediT roles: Investigation, Formal analysis, Validation, Writing – review & editing.
Dissertation relation: Separate repository mining study on tracing bugs.

[2] Bo Wang, Pengyang Wang, Chong Chen, Ming Deng, **Jieke Shi**, Qi Sun, Chengran Yang, Youfang Lin, Zhou Yang, Junjie Chen, Jun Sun, and David Lo. *"Mut4All: Fuzzing Compilers via LLM-Synthesized Mutators Learned from Bug Reports"*. arXiv preprint arXiv:2507.19275, 2025, 28 pages. [PDF] [Code]

CRediT roles: Conceptualization, Methodology, Software, Validation, Writing – review & editing, Supervision.
Dissertation relation: Separate study of compiler testing using mutators learned from bug reports.

[1] Jianming Chang, **Jieke Shi**, Yunbo Lyu, Xin Zhou, Lulu Wang, Zhou Yang, Bixin Li, and David Lo. *"SliceMate: Accurate and Scalable Static Program Slicing via LLM-Powered Agents"*. arXiv preprint arXiv:2507.18957, 2025, 12 pages. [PDF]

CRediT roles: Conceptualization, Investigation, Validation, Writing – review & editing.
Dissertation relation: Separate study of static program slicing with LLM agents.

HONORS & AWARDS

2026 **National Research Foundation (NRF) Postdoctoral Award** (S$250,000), Singapore NRF
ACM SIGSOFT Distinguished Paper Award, ICSE 2026
IEEE Computer Society TCSE Distinguished Paper Award, SANER 2026
SAC Highlight Award, ACL 2026
Distinguished Reviewer Award, AIware 2026
Distinguished PC Member Award, ICSME 2026 (Visions and Emerging Results Track)

2025 **ACM SIGSOFT Distinguished Paper Award**, ASE 2025
IEEE Computer Society Best Paper Award, IEEE Transactions on Software Engineering
OpenAI Researcher Access Program Grant ($5,000)
Google Cloud Research Credits Grant ($2,500)
Research Staff Excellence Awards (awarded to only 4 researchers university-wide), Singapore Management University
SMU SCIS PhD Research Excellence Award, Singapore Management University
SMU SCIS Dean's List Award, Singapore Management University

2023 **Presidential Doctoral Fellowship**, Singapore Management University

SCIS Dean's List Award, Singapore Management University

2022 **Honorable Mention Award**, ACSAC 2022
ACM SIGSOFT Distinguished Paper Award Nomination, ASE 2022

2020 **Outstanding Undergraduate Thesis** (Top 0.2% in province), Jiangsu Province, China
Outstanding Graduate (Top 5%), Yangzhou University

2019 & Before **National Encouragement Scholarship** (Top 3%), Ministry of Education of China
2nd Class Presidential Scholarship, Yangzhou University
1st Class Presidential Scholarship, Yangzhou University

ACADEMIC SERVICES

Area Chair (AC)/Program Committee (PC)/Reviewer

2027 **Mining Software Repositories Conference** (MSR), PC
2027 **International Conference on Computer Aided Verification** (CAV), PC
2027 **IEEE International Conference on Software Maintenance and Evolution** (ICSME), PC
2027 **ACM/SPEC International Conference on Performance Engineering** (ICPE), PC
2027 **International Conference on AI Engineering – Software Engineering for AI** (CAIN), PC
2027 **International Workshop on Large Language Models for Code** (LLM4Code@ICSE), PC
2027 **AAAI Conference on Artificial Intelligence** (AAAI), PC
2027 **IEEE International Conference on Software Analysis, Evolution and Reengineering** (SANER), PC
2027 **IEEE/ACM International Conference on Program Comprehension** (ICPC), PC
2027 **Agentic Engineering Workshop** (AGENT@ICSE), PC
2026 **ACL Rolling Review** (ARR), Area Chair, October Cycle
2026 **International Conference on the Foundations of Software Engineering** (FSE), PC in Ideas, Visions and Reflections Track
2026 **Workshop on Human-Centered AI for Software Engineering** (HumanAISE), PC
2026 **ICML Workshop on Deep Learning for Code** (DL4C@ICML), PC
2026 **International Conference on AI-powered Software** (AIware), PC in Main Track & Benchmark and Dataset Track
2026 **International Conference on Software Maintenance and Evolution** (ICSME), PC in Research Papers & Visions and Emerging Results Track
2025–2027 **International Workshop on Green and Sustainable Software** (GREENS@ICSE), PC
2025–2026 **International Conference on Software Engineering** (ICSE), Shadow PC
2024–2026 **Mining Software Repositories Conference** (MSR), Junior PC
2026 **European Conference on Computer Systems** (EuroSys), Shadow PC & Artifact Evaluation
2026 **International Conference on Evaluation and Assessment in Software Engineering** (EASE), PC in AI Models/Data Track
2025 **Annual Meeting of the Association for Computational Linguistics** (ACL), Reviewer
2025 **IEEE International Computer Software and Applications Conference** (COMPSAC), PC

Organizing Committee

2024 **International Workshop on Software Engineering and AI for Data Quality in Cyber-Physical Systems** (SEA4DQ@FSE), Web Chair

Journal Reviewer

2025–Present **Empirical Software Engineering** (EMSE)

2025–Present **Automated Software Engineering** (ASEJ)
2025–Present **IEEE Transactions on Dependable and Secure Computing** (TDSC)
2023–Present **ACM Transactions on Software Engineering and Methodology** (TOSEM)
2023–Present **IEEE Transactions on Software Engineering** (TSE)

INVITED TALKS

Sep 2026 **National University of Singapore**, TEST Lab, hosted by Manuel Rigger
Fortifying Software through the Lens of Neuro-Symbolic Software Analysis

Dec 2025 **Shanghai Jiao Tong University**, Research Seminar
Optimizing and Fortifying AI Software through the Lens of Artifact Synthesis

Nov 2025 **Singapore Programming Languages Summit 2025**, Invited Talk
Optimizing and Fortifying AI Software through the Lens of Artifact Synthesis

Nov 2025 **A-Mobile Workshop of ASE 2025**, **Keynote**, invited by Guozhu Meng
Optimizing and Fortifying AI Software through the Lens of Artifact Synthesis

Nov 2025 **Korea University**, Workshop on the Next Generation of CodeLLMs and Their Applications, Invited by Dongsun Kim
Optimizing and Fortifying AI Software via Program Synthesis

Sep 2025 **Singapore Management University**, RISE-WASP Workshop, Invited by Lingxiao Jiang
Fortifying Autonomous Systems via Program Synthesis

Nov 2023 **Singapore Management University**, Research Cluster Seminar, Invited by David Lo
Towards Compact and Efficient Language Models of Code via Compression

Oct 2023 **North Carolina State University**, Guest Lecture, Invited by Bowen Xu
Enhancing Efficiency of Large Language Models of Code via Model Compression [Link]

TEACHING & MENTORING

Student Mentoring/Co-Mentoring

PhD Students **Yunbo Lyu**, Project: Demystifying Users' Perception on AI Coding Assistants
Led to publication [19] (ASE 2025). Related preprint [3].

Huihui Huang, Projects: issue–commit linking and memory-leak detection
Led to publications [41] and [28]. Related joint publications [26] and [25].

Research Staff **Wenjia Jiang**. Project: privacy-preserving code agents
Led to preprint [6]. Related joint preprint [5].

Xiuwei Shang. Project: reference-free evaluation of binary reverse engineering
Led to publication [37] (ASE 2026).

Yuqing Niu, Project: developer practices in trusted execution environments
Led to publication [33] (SANER 2026).

Visiting MSc student **Chen Gong**, now PhD Student at University of Virginia
Project: Testing Reinforcement Learning-based Systems
Led to publications [8] (ACSAC 2022) and [14] (IEEE S&P 2024).

Teaching Experience

Jan 2026 **Singapore Management University**, Teaching Assistant in CS706, Invited by David Lo
Software Mining and Analysis, Graduate Core Course

Oct 2023 **North Carolina State University**, Guest Lecture in CSC791, Invited by Bowen Xu
Enhancing Efficiency of Large Language Models of Code via Model Compression [Link]

Jan 2020 - Jun 2020 **Yangzhou University**, Teaching Assistant
Digital Signal Processing, Undergraduate Core Course

RESEARCH GRANTS

2026 - 2030 **Optimizing and Fortifying AI-Assisted Software Ad Absurdum**
National Research Foundation (NRF), Singapore
Total Award: SGD $250K, Principal Investigator

REFEREES

David Lo, ACM/IEEE/ASE Fellow, OUB Chair Professor of Computer Science and Vice Provost
School of Computing and Information Systems, Singapore Management University
davidlo@smu.edu.sg

Massimiliano Di Penta, Full Professor of Computer Science
Department of Engineering, University of Sannio
dipenta@unisannio.it

Gabriele Bavota, Full Professor of Software Engineering and Vice Dean
Faculty of Informatics, Università della Svizzera italiana
gabriele.bavota@usi.ch

Zhenchang Xing, Senior Principal Research Scientist
CSIRO's Data61, Marsfield, Australia
zhenchang.xing@csiro.au